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Medical Diagnostic Aids and the Veterinarian*

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DURING the last 30 or 40 years there has been a spectacular increase in the availability of special instruments and technical procedures which can be utilised by the human clinician in arriving at his diagnosis. I refer to such instruments as the electro-encephalograph, the electrocardiograph, to X-ray apparatus, and to the many techniques associated with X-rays such as pyelography, bronchography, and angiography. In addition the human clinician has at his call a number of tests, depending upon fairly simple biochemical techniques, for the assessment of function in the various organ systems. For example the activity of the respiratory system can be examined for vital capacity by spirometry; metabolic function in general can be assessed by calculating O_2 usage or CO_2 production; the function of the kidneys can be examined by the ability to clear innocuous substances from the blood plasma in a certain time, and the liver by the excretion of bromsulphalein. There is no doubt that such tests add precision to diagnosis although it must be realised, and it cannot be insisted upon too often or too emphatically, that such diagnostic aids are not a panacea nor can they be substituted for the clinician's art and experience.

The instruments and techniques I have mentioned briefly have only been utilised to a very limited extent in veterinary medicine and I want to discuss why this should be so, and to suggest possible ways and means whereby the results obtainable from these aids to diagnosis can be made more available to veterinary surgeons.

There is no doubt that one of the prime reasons why these diagnostic procedures are not available to the veterinary surgeon is the initial cost of the instruments together with the high cost of upkeep. I cannot see that any veterinary firm could justify acquisition of these precision instruments without putting up their charges to such a figure that no animal owner could afford to consult them. For example, a very simple and perhaps not very efficient electrocardiograph will cost about £250, while X-ray equipment capable of being used for the examination of the chest and abdomen of all veterinary patients would cost many thousands of pounds as well as requiring special premises for its installation and a special staff to manipulate it. This question of cost of equipment is one that must always be with the veterinary profession and although I recognise it as a very real problem I do not consider it to be an absolutely over-riding factor.

To my mind there are three main reasons for the non-development of instruments for use in clinical medicine. First there is the nature of our patients. The marked variation in size and conformation even of individuals within a species makes it difficult to design instruments for general application. Consequently, the instruments cannot be mass produced, and construction costs remain high. The second reason is that our patients are often apprehensive when being examined clinically, especially if they are in strange surroundings. One of the obvious symptoms of this apprehension is the tensing of the abdominal muscles, but this state of fear is also projected to other systems. For example, marked changes in cardiac output can occur, or hyperpnoea may be induced so that not only gaseous exchange is affected but a mild alkalosis may occur; and I need not remind you that clinical examination may stimulate the alimentary tract and the urinary system. These physiological changes which occur in animal patients can make for confusion, and tend to reduce the diagnostic value of some tests. The third reason is the limited number of veterinary hospitals available to accommodate patients for the period necessary to conduct a full examination.

* Presidential address delivered to the Central Veterinary Society on May 3rd, 1956.

Problems for the Veterinary Clinician

I think I can best illustrate the difficulties confronting the veterinary clinician by comparing the use of certain instruments in veterinary and human clinical practice. In human medicine blood pressure can be recorded in a variety of ways. In hospitals precise records can be obtained from the unanaesthetised subject by direct puncture of an artery or by cardiac catheterisation following venepuncture. For obvious reasons this direct method has little application in veterinary practice and in most human subjects blood pressure is most often recorded indirectly. As you know the sphygmomanometer is a piece of basic equipment in all doctors' surgeries; it can be used to measure both diastolic and systolic blood pressure indirectly without any discomfiture to the patient. The site chosen for the application of the sphygmomanometer cuff is to the upper arm and the blood pressure is assessed by auscultation of the so-called kropotkov sounds in the radial artery. A similar anatomical arrangement does not occur in any of the domestic species, the nearest being in the hindlimb of the greyhound where the popliteal artery can be palpated or auscultated. Diastolic and systolic values can be obtained in this way in a small percentage of dogs. In the great majority of dogs, however, it is extremely difficult to apply the cuff, and often when the cuff is partially inflated the tension developed causes the animal to move its leg and so dislodge the cuff. Even when successfully applied, inflation of the cuff causes a certain degree of apprehension in the animal with the result that the brain is activated and this causes stimulation of the adrenal medulla. The hypertensive effect of the released adrenaline usually vitiates any values of the blood pressure recordings obtained in this way.

Another example of an instrument that has proved to be of great value to the human clinician, but not so much to the veterinarian is the electrocardiograph. The electrocardiograph is an instrument which has been developed to register the small bio-electrical potential changes which are generated in association with the contraction of cardiac muscle. In veterinary electro-cardiography the quadripedal posture of patients is a great hindrance for the E.C.G. is recorded ideally with the patient in a state of complete relaxation. This state of affairs can never, or at best only very rarely, be achieved in veterinary practice without the use of general anaesthesia, a condition which of course affects the normal electrocardiagraph. The slightest movement of the animal on record produces bursts of electrical activity in the muscles which swamps the E.C.G. recording. One should emphasise, too, that the E.C.G. gives little information on the functional activity of the heart valves, its value being restricted to a demonstration of the activity of the contractile mechanisms of the heart and in particular of the myocardium. Electrocardiography has become a very valuable tool to the human cardiologist, the interpretation of E.C.G. records depending upon the integration of records taken directly from the chest over the heart as well as from the limbs. The nature of E.C.G. records is associated with the position of the heart in the thorax, and since in the domestic species the heart is slung at an angle of 90° compared with the human heart, it is obvious that the findings of human electrocardiology can be applied to veterinary cardiology only with some reservation.

I should now like to mention very briefly one example of a biochemical diagnostic technique. In human medicine the functional activity of the kidneys can be assessed with some degree of precision. The tests depend upon gauging the rate of filtration of plasma over Bowman's capsule and the subsequent reabsorption of most of this tubular urine by the renal tubules. In order to do this the patient must be taken into hospital, and a continuous injection of some inert substance such as inulin or para amino hippuric acid made. Urine is collected at short intervals, and by simple proportion the amount of inulin or P.A.H. cleared from the plasma is calculated. Normal values for the human are well established so that comparisons can be made with the patient. Such a procedure, however, is very difficult in veterinary medicine for urine samples must be collected every 15 minutes. This type of collection is difficult but not impossible, for the animals could be kept in special kennels or the bladder could be cannulated. The main difficulty in such tests applied to veterinary subjects is the collection of uncontaminated excretory products as well as the necessary removal of multiple blood samples for analysis.

Improving the Present Position

From these examples I think it is apparent that the diagnostic aids used by the human clinician have only a very limited application in veterinary medicine at present. Can this position be resolved? Is it permanent or can we expect some improvement in the future? With certain reservations I believe that the position can be bettered a great deal but only if the initiative comes from the veterinary schools and a few other similar establishments. I say this for I cannot see that any other organisation could provide the necessary facilities for the investigation and development of auxiliary aids to diagnosis. Money, space, time, and technical assistance are the prerequisites to such an examination. Only at some institute such as a veterinary school could expensive equipment and expensive technical assistance be used sufficiently often to justify its purchase. Perhaps one of the first things that requires investigation is a thorough examination of the so-called tranquillising drugs, for example chlorpromazine and reserpine. This type of drug may provide the means of allowing our patients to relax without necessarily obscuring any salient symptom at the same time.

In order to carry out these clinical investigations an increase would need to be made in the staff of the veterinary colleges or, and perhaps preferably, an expansion should be made in post-graduate research appointments. This would require extra funds and I am pleased to note that the A.R.C. are now prepared to disburse grants for training in clinical research.

I can imagine that renal physiology associated with leptospiral infection in the dog would provide one field for investigation. Such a project would not be easy, for the application of renal clearance tests

would probably require the development of special kennels comparable to a metabolism cage, in order to collect the urine samples. Cardia function, respiratory and digestive function, as well as the clinical pathology of the skin are obvious subjects that require examination, and I am sure that with some ingenuity and a great deal of perserverence very much useful information could be collected and passed on to the practitioner to aid him in making his diagnosis.

Assuming that use of these tests can be organised, how can the benefits best be handed on to practising veterinary surgeons? I contend that there are many and varied channels for doing this. First, by reason of the increased facilities of instruments, hospital space, and technical assistance, the veterinary schools would be able to provide a wider consultative service. This would provide the very necessary individual contact and incidentally would provide a source of clinical material for teaching. Refresher courses for small groups could be arranged emphasising the newly-developed methods and techniques. One would also hope that those who had had the good fortune to be able to develop special techniques and special knowledge would disseminate this at congresses and meetings as well as by writing articles and monographs. All this, however, would not help the isolated practitioner unable to buy expensive instruments; so it would be absolutely essential for the expert to correlate his recorded measurement with some observable symptom. For example, perhaps hypertension could possibly be correlated with visual changes in the retinal vessels, so that possession of an ophthalmoscope would compensate for complex blood pressure measuring gear such as capacitance manometers.

The space of this short address has only allowed me to indicate in very broad terms why it is not possible at present to use diagnostic aids in veterinary practice. Given adequate funds there is no reason why, in the near future, more physical and biochemical techniques should not become available to the veterinary surgeon. For the time being, however, the practising veterinary surgeon will have to continue to make his diagnosis by an objective appraisal of the symptoms presented by his patient.

DOCTOR OR VET?

The following note appeared in *The Daily Telegraph* of July 27th:—

In the Third Mountain Regiment, Royal Artillery, during the last war many of the drivers and gunners preferred to consult the R.A.V.C. sergeants rather than their R.A.M.C. colleagues.

They reckoned that the former, having to deal with dumb animals, were the better diagnosticians.

In one battery after a long route march, when evening stables were over, a small queue of slightly disabled artillerymen used to wait outside the Blue Cross tent for diagnosis and treatment.

Meanwhile, the R.A.M.C. sergeant, it is rumoured, sat alone in his Red Cross tent, biting his nails in impotent fury.

A Single Case Record of the Use of Stainless Steel Femoral Head Prosthesis in *Osteochondritis Deformans Coxae Juvenilis* (*Coxa Plana*)

BY

Z. D. VINCENT *

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Subject

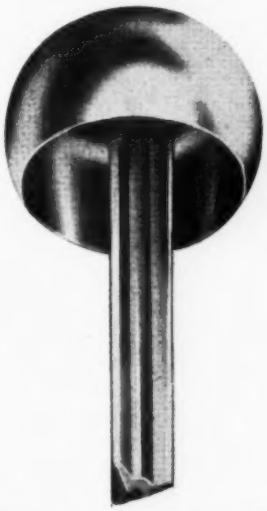
SMOOTH-HAIRED Terrier dog (male), aged about 12 months.

Case History

When first presented for examination the animal was lame in its right hind leg. No history of an accident or injury was given by the owner. It was reported that the lameness had appeared about eight months earlier, and that it had become progressively worse. Clinical examination revealed pain at the hip joint, and X-ray examination was advised. Plate No. 1 showed unilateral resorption of the femoral head (right) and mild flattening of the femoral head (left). Diagnosis of *coxa plana* or Legge-Perthe's disease, as described by Formston & Knight (1942), was established. It was felt that the usual treatment for *coxa plana* would not satisfy the owner, and in order to save the animal's life an attempt was made to replace the diseased femoral head by a stainless steel prosthesis.

Prosthesis

The material used in this case was F.M.B. non-toxic stainless steel. The shaft and the head were turned from one piece. The head was a solid spherical ball, and the shaft was made in the form of a solid, round, sharpened nail. The approximate size of the prosthesis and shaft was determined from a pelvic radiograph. Allowance was made for the magnification of the X-ray, the ratio being generally speaking, 100 : 110.



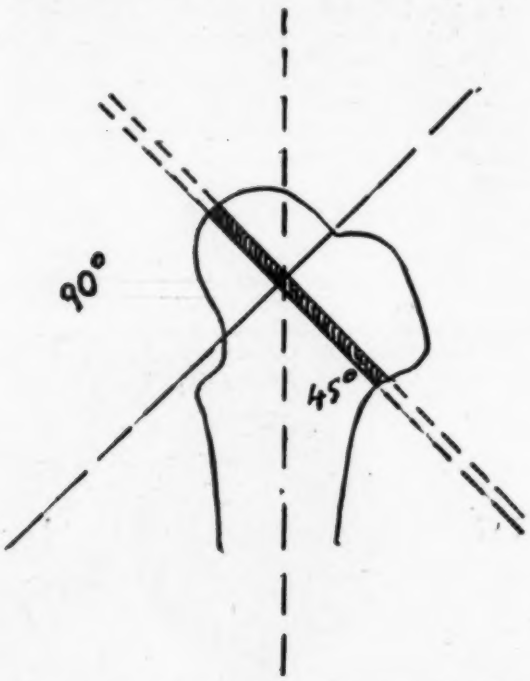
Stainless steel prosthesis (Fitzgerald type).

* Now resident at Rondebosch, South Africa.

Operation

9.4.55.—The dog was deeply anaesthetised with intravenous nembutal and an area from the spine to the hock was clipped and prepared for surgery. The approach to the coxofemoral joint was the same as that described by Brown (1953). Two small vessels were ligated with braided nylon. The joint capsule was exposed and the dorsal portion of the acetabulum easily palpated. The incision was made into the joint in its entire dorsal circumference. The leg was rotated medially and the round ligament was cut with curved scissors. The diseased head of the femur was dislocated from the joint. The proximal end of the femur was grasped with a small, bone-holding forcep and after reflecting the joint capsule from the neck of the femur, the diseased head was sawn off at the right angle of 90° to the neck. The acetabulum was normal.

An intramedullary pin, very little narrower than the shaft of the prosthesis, was used to drill a hole through the remaining part of the femoral head and neck, across the medullary canal and out below the trochanter major. The drilling was done at right angles to the cut surface.



The correct location of this hole is one of the most important steps in the operation, and the final result depends upon it (Brown, 1953 ; McCarthy, 1955). The prosthesis was inserted into the drilled hole and tapped into place. A piece of wooden dowelling with a drilled hole was used for driving the prosthesis into place. There was no difficulty in replacing the stainless head into the acetabulum. Procaine penicillin was put into the joint. The closure was effected as described by Brown (1953). The joint capsule, muscle layers and subcutaneous connective tissue were sutured with braided nylon of appropriate size, and the skin wound was closed with monofilament nylon. Procaine penicillin was applied between each muscle closure, and 500,000 units penidural penicillin injected intramuscularly. The leg was placed in a sling bandage.

Post-operative Care and Progress

10.4.55.—X-ray (plate 2) taken. Prosthesis in correct position. Temperature 102·3°. 300,000 I.U. penidural penicillin given intramuscularly. The dog was sent home and the owner was advised to watch the general condition of the animal and to keep the leg in a sling.

12.4.55.—The sling bandage was removed. Temperature 102·3°. 300,000 I.U. penidural penicillin given intramuscularly. Backward extension of the leg was painful.

16.4.55.—Temperature normal ; general condition satisfactory ; skin sutures removed ; healing by first intention. Muscle atrophy, although present, was not pronounced. The leg was carried off the ground with the toe turned in.

10.5.55.—Limited use of the leg ; no pain on palpation over the hip joint, but backward extension still painful.

24.5.55.—Used the leg when walking but ran on three legs. Pain on backward extension.

18.6.55.—Walking on all four legs but still reluctant to run. Full backward extension of the leg possible but still with some pain. X-ray (plate 3) shows resorption of the bone around the shaft of the prosthesis.

16.7.55.—The gait was quite normal except after a long walk when a limp was noticeable. X-ray examination shows the resorption of the bone around the shaft of the prosthesis to be static.

17.9.55.—Five months after the operation the dog had normal gait, and he played and jumped. The X-ray (plate 4) shows consolidation of the bone around the shaft of the prosthesis.

Discussion

It was felt that the above case was worthy of record, firstly, because the operation itself can well be carried out with the facilities available in the average private practice, despite the fact that it is a long step forward in bone surgery ; and secondly, on account of the interesting complication, namely, resorption of the bone around the shaft of the prosthesis. A study of the reported case suggests that it would be advisable to use a hollow stainless steel prosthesis (Fitzgerald type), instead of the solid one. This, however, would require an additional instrument in the form of a trephine for the preparation of the femoral head. The most satisfactory way of preparing the femoral head itself would be to pass down the trephine leaving a cylindrical stub corresponding with the recess inside the prosthesis. The advantages of the Fitzgerald type of prosthesis are : (*a*) less weight as far as metal is concerned, and (*b*) better grip of the bone by the prosthesis itself. The shaft should be long enough to penetrate the outer cortex and by doing so, to give a better grip in a harder part of the bone. The three-flanged shape of the shaft would require a smaller hole in the neck of the femur and would provide a better grip and prevent rotation.

(*Concluded at foot of col.* 1, *page* 511)

PLATE 1.

PLATE 3.

The Laboratory Mouse in Great Britain.—IV. Intercurrent Infection (Tyzzer's Disease)

BY

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TYZZER'S disease causes concern at the present time to at least eight British mouse colonies (see Table II, Tuffery, 1956) although, in one long term view, it is of relatively small importance because of the small losses it creates. Epidemics of a severity sufficient to cause some worry to mouse breeders do occur, however, and in any case an infected colony, regardless of the direct effects of the disease, is never to be regarded as fully satisfactory.

Tyzzer (1917) first described the infection, which he found was confined almost exclusively to a strain of Japanese waltzing mice he was using, and which were apparently very susceptible to it. He found only two cases among ordinary laboratory mice, and concluded that, in his colony, the ordinary mouse might suffer from a mild infection of the intestinal tract which was generally unrecognised, and that such animals had acted as a source of infection for his Japanese mice. It is implied that he does not consider the infection to be very widespread. "No evidence has been obtained, however, that it occurs generally, or even frequently, among common tame or wild mice."

The results of the present survey show that this disease is probably very widespread among laboratory mice, and that it does cause appreciable losses, though its incidence is probably far less than in Tyzzer's Japanese waltzing mice. Practically his entire stock became infected (*i.e.* showed macroscopic liver lesions) at the height of the epidemic, whereas in ordinary colonies the proportion is never as high.

The Natural Disease

Tyzzer's description of the symptoms is quite typical of those found in mouse colonies of the present day. An acute form occurs quite frequently among young, newly weaned mice, which show a severe diarrhoea ("scouring") for a few days prior to death. At autopsy, there is found a reddening of the intestinal mucosa, and liver lesions, though these do not often occur in the most severe cases. In the most acute cases, there may be no signs until 24 to 48 hours before death, when the animal develops diarrhoea and passes watery, slimy faecal material. In general, at *post-mortem* examination, the liver is the only organ showing pathological changes. In the worst form, it may be covered by numerous white or yellowish circular areas of necrosis, some of which may show a darker central region. Histologically, infected livers show patches of necrotic tissue with extensive infiltration of polymorphonuclear leucocytes. Long, slender bacilli (Tyzzer's *Bacillus piliformis*) lying parallel to one another in bundles are frequently seen inside whole cells lying at the edge of necrotic regions. These bacilli characteristically stain in an irregular fashion, and swollen structures, which Tyzzer took to be normal type eubacterial spores, can sometimes be seen. Sections of the caecum and first portions of the large intestine frequently show epithelial cells similarly invaded though to a much lesser extent. Apart from the fact that it is not always as easy to see *B. piliformis* as Tyzzer would suggest, his findings are supported by various observers in this country.

Tyzzer considered this disease to be primarily an infection of the alimentary canal, and was quite satisfied that *B. piliformis* was the aetiological agent concerned. Normally, it entered the living epithelial cells of the gut, where it caused very little damage—infected cells were apparently quite normal in all other respects. Sometimes the bacilli would enter the underlying tissues where they multiplied and spread into fresh cells, eventually reaching some small blood-vessel, and then into the blood-stream. They were then carried to the liver. They could also enter the blood-stream by being carried there by phagocytes, but he was of the opinion that entry via the lymphatics did not occur. The organism was never found in any tissue other than that of the liver and intestine. *B. piliformis* was considered to be only slightly pathogenic in view of the lack of changes seen in intestinal cells. In the waltzing mice, multiplication in the liver led to a marked inflammatory reaction followed by

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A Single Case Record of the Use of Stainless Steel Femoral Head Prosthesis, etc.—*Concluded.*

The use of acrylic femoral head prostheses by Archibald & Ballantyne (1953) and L. C. Vaughan (1955) may have some advantages over the use of stainless steel, but further research is necessary before an adequate opinion can be expressed.

Acknowledgments

I would like to thank Drs. G. E. Thomas and J. C. Kee for their valuable criticism and advice on the reported case; Messrs. Down & Bros. and Mayer & Phelps, Ltd., for their interest in the case, and for manufacturing the stainless steel prosthesis; and Miss Hilary Bowden for her help during the operation and X-ray work.

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cell necrosis, the animal finally succumbing if the dosage was high enough. Transmission was considered to be effected by contaminated food and surroundings, and by the direct ingestion of faeces. Its apparent persistence in infected cages was supposed to be due to the resistant spore-stage.

The Experimental Disease

Since Tyzzer's time little attention has been devoted to this disease, and one is still uncertain as to its aetiology. Gowen & Schott (1933) investigated the powers of resistance of five strains of mice to this infection, and concluded that susceptibility to Tyzzer's disease segregates independently of either the waltzing or white factors, or sex. Resistance is a major dominant factor, modified by the presence of other factors. As they themselves admit, the groups used in their experiments were smaller than one would prefer, but it is the apparent ease with which they infected their mice which raises a doubt in one's mind. In the experience of several establishments, the infection could not be transferred to mice by feeding infected livers, yet Gowen and Schott appear to have achieved this with ease and regularity. In view of the widespread nature of the disease, and the absence of a method for guaranteeing the freedom from infection of test mice, one is unable to accept claims of transmission by any methods too readily. Rights, Jackson & Smadel (1947) and Porter (1951-2) reported their inability to transfer infection by these means.

The work of Rights, Jackson & Smadel (1947) appears to be the only real attempt to study the disease since its discovery. These workers experienced an outbreak among their mice during the late winter and early spring period, which was associated with an overcrowding of their breeding stock. Their macroscopic and microscopic findings accord well with those of the original description, except that they saw no structures they could consider to be spores. Among several workers at various establishments at the present time there is doubt that the infecting organism is a spore-forming bacillus, but the question is still open for experiment. Rights *et al.*, failed to transmit infection either by feeding, or by the intraperitoneal, intravenous, or subcutaneous inoculation of material. A suspension of infected liver material could be inoculated intracerebrally, and the mice would regularly show signs of an encephalitis within the following three to eight days. Affected animals developed an increased irritability and paralysis of one or more limbs which was followed by convulsions, and death occurred within a few hours of these signs. At autopsy, there were no macroscopic lesions either in the brain or the viscera. On histological examination, areas of complete liquefaction necrosis, sometimes surrounded by a slight infiltration of polymorphonuclear cells, could be found in the brains of infected mice. Typical fusiform banded bacilli could frequently be seen at the edges of these necrotic foci, generally intracellular in position. The " encephalitis " could be passaged repeatedly if a 10 per cent. suspension of infected mouse brain were used, and this could also infect rats, rabbits, and hamsters when inoculated intracerebrally.

Rights *et al.* were, like other workers, unable to culture *B. piliformis* on any of the routine bacteriological media, but with tissue cultures they appeared to have some success. In minced chick embryo tissues, morphologically typical organisms could be seen in the first cultures, and these were virulent when injected into mice. Subcultures, however, contained very few organisms, and were avirulent. Mouse embryo tissues supported an abundant growth of the organisms through four subcultures, but only the original and the first subculture were pathogenic. The second, third and fourth subcultures, although containing numerous organisms, were quite without effect. Unfortunately, this work does not establish conclusively the aetiological nature of this disease; the authors were well aware of this. Their anomalous tissue culture experiments might be explicable if *B. piliformis* is the true aetiological agent—which, however, loses its virulence very rapidly on subculturing—or the actual agent could consist of two entities—one the bacterium, and the other an agent which would not grow in their tissue cultures. One other factor, however, needs to be considered when the work of Rights *et al.* is being assessed. Mice are capable of carrying as latent infections a number of neurotropic viruses and it seems that the encephalitis described by these workers may in fact be due to one such virus, the latent infection being stimulated into overt disease by the techniques they used. Their description is not very full, but it does seem possible that the encephalitis was not due to the Tyzzer agent, but to a virus of the FA or GDVII type. The lesions and symptoms accord in some measure with those described by Theiler & Gard (1940) for mice infected by the intracerebral route with these two agents. This possibility does not seem to have occurred to the authors of this work.

The Disease in British Colonies

Porter (1951-2) has described the methods used by one mouse-breeding establishment for the control of Tyzzer's disease. After other methods had been tried without success, a control method was evolved based upon the assumption that susceptibility to this disease was inherited, as demonstratetd by Gowen and Schott. In essence, a completely new breeding nucleus was formed, which was derived from animals with no previous history of the disease. Breeding pairs were set up from animals whose litter-mates, parents, cousins and grandparents had shown no signs of infection when killed and subjected to autopsy. The method led to the formation of a colony which was apparently free from the infection, but fresh outbreaks recurred at later periods.

Another method has also been tried (Scarnell, 1953) in an attempt to control this disease. Breeding stock was selected from the litters of healthy parents, and two from each litter were sacrificed just before the breeding units (trios) were to be assembled. If the two test animals were normal, their litter-mates were used as breeding stock. During the period November 5th, 1952, to November 16th, 1954, 275 test mice were killed, and two showed the typical lesions on the livers. During the same period, many of the

breeding mice became—or were already—infected, and died or were culled, so that the method was not conspicuously successful.

The epidemic behaviour of this disease would seem to be that of a near perfect parasite—that is, of a parasite with a low virulence and high infectivity (a high degree of adaptation to the parasitic mode of life) for its host species. Among the eight colonies with experience of Tyzzer's disease, either at the time of this survey or within the past year or two, the disease showed certain characteristics common to each outbreak. In no case was a very high mortality rate found, such as Tyzzer found in his Japanese mice. In each colony there was an epidemic outbreak of the disease (as shown by an increase in the number of dead and culled animals showing the usual liver lesions), which died down within a few weeks. In the period preceding, or following, the epidemic, there was usually a much lower incidence—just enough to remind one of its permanent presence.

At the present time there is only one way of telling whether a mouse is a case of Tyzzer's disease: to look, at death, for the typical macroscopic liver lesions. If a mouse can suffer from the disease and yet not show these lesions (and this is very likely to be the case), we are quite unable to distinguish it from the uninfected animal. Thus measures of the incidence of Tyzzer's disease are really measures of the incidence of mice suffering from the grosser effects of the infection (the " clinical " cases). Fig. 1 shows outbreaks in two colonies, as measured by the number of deaths and culls found with the disease. The graphs for these two colonies must not be too closely compared since the colonies were different sizes, and differed in many other respects. Colony No. 2 used a trio system, while colony No. 1B used a pairs system. The incidence curves are roughly the same shape in all three cases, and they show little signs of any seasonal influences—the peaks being in early spring, summer, and late autumn, respectively.

The gap between the two outbreaks in colony No. 2 is of interest, though its significance can only be guessed. During that period (weeks 36 to 97) only three cases of Tyzzer's disease were found. This would suggest that the disease was in fact still present in a latent, undetectable form, during this period, particularly as the colony has remained strictly closed since its foundation, there were no major changes in husbandry, and the culling and *post-mortem* examinations were carried out with more or less the same methods all this time. The histogram for the second colony (No. 1B) does not show any period during the existence of the colony when there was a low, steady, incidence of cases. In this colony the infectious agent appears to have entered shortly after it was established—or possibly even with the actual foundation stock—and spread immediately throughout the stock at a gradually increasing rate which culminated at the peak of the outbreak in week 36; Fig. 2 shows the percentage incidence of cases during this outbreak. The population during this epidemic remained more or less constant, about the 2,500 mark, but the point of interest is the extremely low case-rate even at the height of the epidemic—in week 36, cases of Tyzzer's disease were only 2.13 per cent. of the population at the beginning of the week. This is very low, but the probability is that the incidence in other colonies in this country is of the same order. If, as Tyzzer suggests, the aetiological agent has only a very low pathogenicity, then one might expect low incidence rates when one is limited to the detection of the clinical cases only, and there could be a high percentage of subclinical (latent or carrier) infection throughout the colony.

Some observations by Robinson (1955) suggest very strongly that Tyzzer's disease is caused by an agent of low pathogenicity which characteristically gives rise to a high proportion of subclinical (undetectable) cases. During the course of experiments involving the irradiation of mice with X-rays, it was found that a higher proportion of deaths occurred than was expected had the deaths been due to the irradiation itself. It was found at autopsy that these mice were suffering from Tyzzer's disease and that the incidence

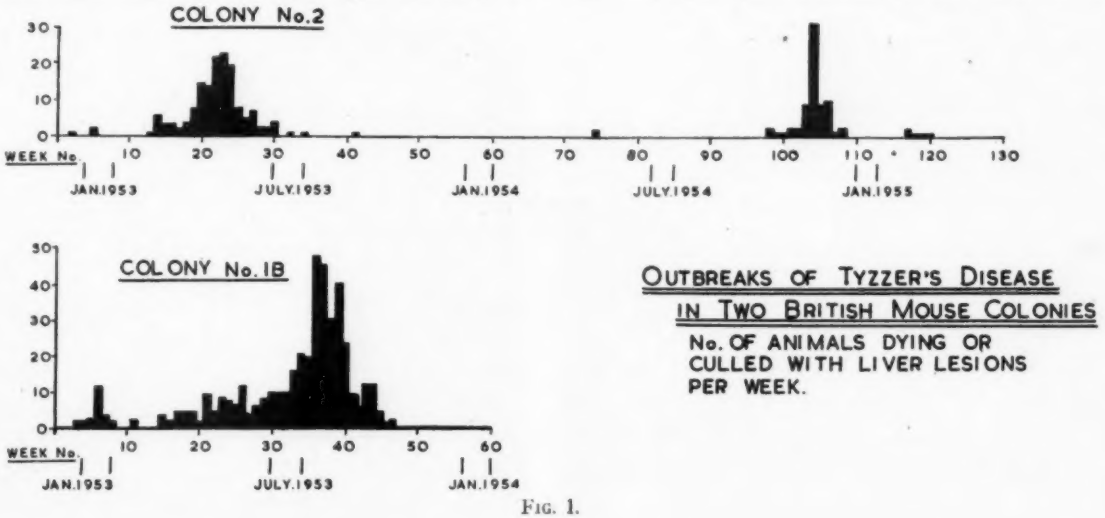

FIG. 1.

among the irradiated mice was far higher than among the controls. These experiments were performed on mice bred in colony No. 1B, during July, 1953; that is from mice issued from the colony shortly before the epidemic reached its peak. They afford a good example of the way mice infected with this disease can vitiate experimental work, and show that irradiation appears to be capable of lighting up a benign infection into an overt, fatal, infection. Additionally, since the proportion of mice dying with Tyzzer's disease was so high (47 per cent. in one batch), compared with no deaths among the controls, the carrier rate would seem to be very high.

Porter (1951-2) states that mice died from Tyzzer's disease during use in the course of an outbreak in his colony, but apart from this instance and that of Robinson, this disease does not appear to interfere with most types of experimental work. There are no other cases of the activation of latent infection through experimental use. For this reason, its importance as an infection of laboratory mice is probably not quite so great as that of ectromelia or salmonellosis. The problem of Tyzzer's disease in laboratory mice is much like the problem of infantile diarrhoea—one is not quite sure just what its effect on experimental animals is, its aetiological nature is still open to doubt, its epidemiological nature has still to be accounted for, and altogether so little is really known about it that one cannot recommend any specific control or remedial measures.

Discussion

The importance of Tyzzer's disease to users and breeders of mice lies principally in the fact that as yet there are no really reliable methods for its control. In the colony, which is conscious of the value of *post-mortem* examinations and keeps a close watch on disease incidence, it seems likely that the level of infection can be kept reasonably low by vigorous culling of contacts of dead or culled mice found with the typical liver lesions. But this is no guarantee that an outbreak will not occur sooner or later, as it is not possible to assess the factors concerned which will precipitate an epidemic of this disease. Neither is it known whether this culling will control inapparent infection rates. On purely practical grounds, the culling of contacts seems to pay dividends, despite its empirical nature. Were adequate records held, it would probably be found that this disease does not give very high incidence rates (*i.e.* infections sufficiently typical to be recognised) as compared with, say, ectromelia. Nevertheless, an infected colony can never be entirely satisfactory, and will always involve more expenditure in labour and money than need otherwise be the case.

Summary

Tyzzer's disease is one of the four most important infections of laboratory mice in this country at the present time. It may give rise to epidemic outbreaks which, if not killing a very high proportion of those

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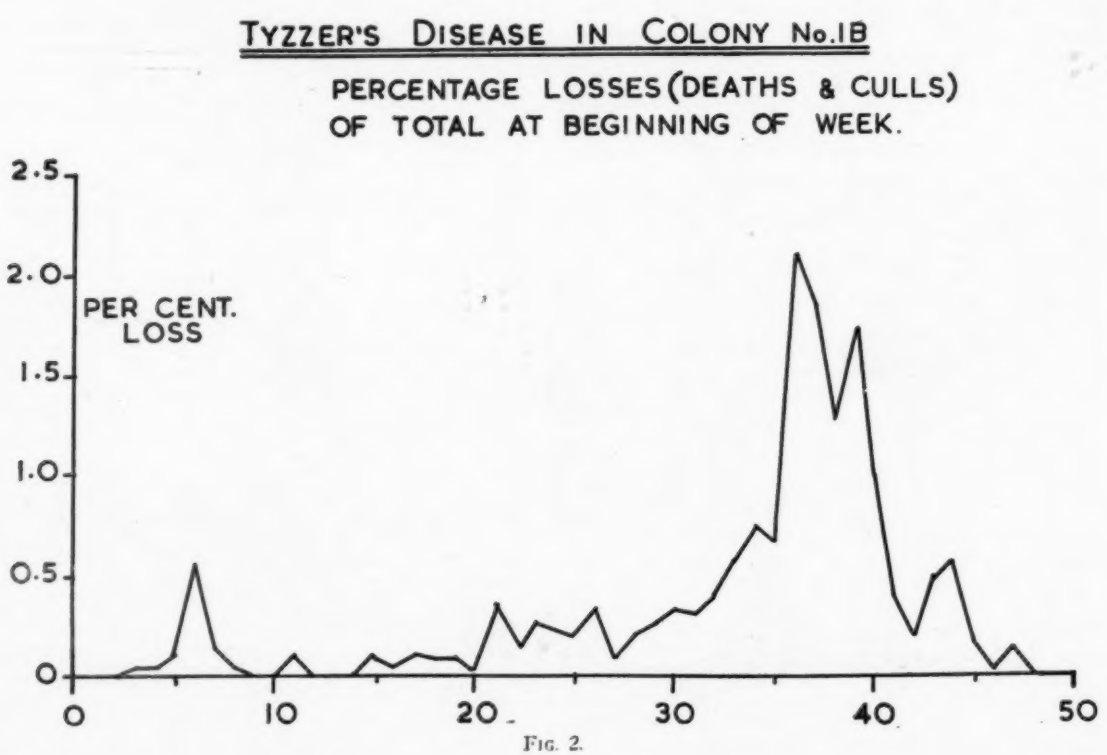

FIG. 2.

In Brief

ABORTION AND INFERTILITY IN SHEEP

Virus Abortion

Within the last few years the aetiological agent of enzootic abortion has been shown to be a virus of the psittacosis group (Stamp, McEwen, Watt & Nisbet, 1950). The disease is easily diagnosed either by examination of stained smears from the placenta or by the complement fixation test (Stamp, Watt & Cockburn, 1952). Since the disease is now readily diagnosed it has been recognised in most sheep farming areas of England and Scotland.

The dissemination of the virus would appear to take place only during the lambing period and for the few weeks previous to this when abortions are occurring. The introduction of infected ewes and gimmers to a farm free from the disease does not lead to abortion in the home flock until the second lambing time after purchase. There is good evidence that the virus disseminates at lambing time not only to mature sheep but also to hoggs and to newborn lambs, the latter carrying latent infection until they become pregnant (McEwen, Littlejohn & Foggie, 1951). The introduction of such latently-infected young stock to a clean flock is potentially dangerous. Ewes that have aborted or lambed prematurely will not do so a second time.

Vaccination with formalinised suspensions of infected ovine foetal membranes or infected yolk sacs of fertile hens' eggs have been used successfully (McEwen, Stamp & Littlejohn, 1951; Littlejohn, Foggie & McEwen, 1952). More recently, adjuvant vaccines have given even more satisfactory results (McEwen & Foggie, 1954; McEwen, 1954; McEwen, Dow & Anderson, 1955) and such vaccines are now being used extensively to give satisfactory control of the disease.

Brucella Infection of Rams and Ewes

A genital disease of sheep in New Zealand and Australia has been shown to be due to infection with an organism of the genus *Brucella*, possibly a mutant form of *Brucella melitensis*. The infection appears to be widespread in sheep in both countries and is responsible for infertility in rams and abortion and premature lambing in ewes although the latter only appears to occur in New Zealand (Crawford, 1949; N.Z. Department of Agriculture Annual Report, 1951-2; McFarlane *et al.*, 1952a and b; Simmons & Hall, 1953; Buddle & Boyes, 1953; Hartley *et al.*, 1954a). The disease has been successfully reproduced in experimental animals using cultures of the organism (N.Z. Dept. Agric., 1951-2; McFarlane *et al.*, 1952b; Simmons & Hall, 1953; Buddle & Boyes, 1953; Hartley *et al.*, 1954b; Jebson *et al.*, 1954). Attempts are at present being made to develop an effective vaccine (Buddle, 1954). Two recent papers dealing with the epidemiology of the disease have been published (Hartley, *et al.*, 1955; Buddle, 1955).

A *Brucella* organism causing abortion of sheep has only been recorded once in Great Britain (Young, 1953) but visiting workers to Britain from Australia and New Zealand stress the point that the lesions in the epididymis of rams as seen by them could readily be overlooked.

J. T. STAMP (November, 1955).

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The Laboratory Mouse in Great Britain, etc.—*Concluded.*

exposed, probably infects a considerable proportion, setting up undetectable latent cases. Its presence within a colony will throw suspicion upon the quality of mice produced by that colony, may even render such mice unsuitable for certain types of work, and will cause extra trouble to the breeder.

Acknowledgment.—I should like to express my thanks to Mr. J. Scarnell, B.V.SC., M.R.C.V.S., for giving me certain data I have used in this paper.

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Current Literature

ABSTRACTS

Canine Prostatectomy. ARCHIBALD, J., & CAWLEY, A. (1956). *J. Amer. Vet. Med. Ass.* **128.** 173-7.

The outstanding signs of prostatic enlargement in the dog, unlike man, are those of constipation and tenesmus, but the anatomical position of the organ makes it difficult to approach surgically. The authors have evolved a modification of Matera's technique.

The dog is placed upon its back and a catheter of suitable size passed into the bladder (where it is allowed to remain for 48 hours post-operatively). A midline skin incision is carried from the umbilicus to the prepuce, then curving laterally to the penis it extends back over the pubis. During routine haemostasis, particular attention should be paid to the branch of the caudal superficial epigastric vein found just posterior to the anterior end of the prepuce. After reflecting the penis laterally, the abdominal cavity is entered through the whole length of the first skin incision and after the wound lips have been spread, a soft moistened towel packs the intestines into the anterior part of the abdomen, leaving the urinary bladder, the prostate gland, and the lower portion of the large intestine in the operative field.

In tying off the prostatic arteries, care should be taken to leave intact the vesicular and urethral arterial supply. The prostate is dissected from the neck of the bladder by scissors, the neck of the bladder secured by Allis forceps and the catheter withdrawn. The prostate is similarly dissected from the urethra and a second pair of Allis forceps, grasping its distal end, prevents it slipping back into the pelvic cavity. The vasa deferentia with associated vessels are each twice ligated and divided between ligatures. Thus the prostate gland is entirely free from its attachments and is lifted out of the abdominal cavity by sliding it off the catheter, which is now re-inserted into the bladder. This organ is moved posteriorly to the cut end of the urethra and anastomosis achieved by simple continuous sutures of 00 chromic catgut.

Adequate photographs and diagrams illustrate the essential steps in haemostasis.

J. P.

The Use of Lobeline as a Respiratory Stimulant in Small Animal Practice. HASTE, F., & LAUFENSTEIN, H. (1955). *Canad. J. Comp. Med.* **19.** 313-4.

Lobeline is recommended as a respiratory stimulant for dogs in case of respiratory arrest or depression from anaesthesia, shock, or in puppies delivered by caesarean section.

The stimulant effect occurs almost immediately after the intravenous injection of the drug and lasts for one or two minutes only. The drug has objectionable side and toxic effects in overdosage. The authors' recommended dosage of lobeline is ¼ grain per 20 lb. bodyweight. This amount is dissolved in 4 c.c. water, and half the dose is injected, followed by the remainder "to effect."

Coramine may be administered soon after lobeline to continue the stimulation of the respiratory centre.

J. T. E.

Hypothermia by Cold Temperatures. KNOWLES, R. P., & WASMAN, S. (1956). *Vet. Med.* **51.** 26.

Artificial hibernation as an aid to heart surgery has been used in a dog harbouring heartworms. An account of such an operation carried out at an American veterinary convention describes the salient features of the method.

The dog was deeply anaesthetised with pentobarbitone and then chilled for half an hour in a bed of cracked ice until its rectal temperature had fallen from 101° to 84° F. It was then operated upon after being transferred to a padded operation table. Approached through the right fourth inter-rib space, the heart was emptied of blood by the successive clamping of the great veins; the aorta was then clamped and the heartworms removed through a slit made in the pulmonary artery. A reversal of the procedure completed the operation.

Hypothermia depresses the body metabolism to a degree at which the heart requires only 20 per cent. of the normal oxygen supply and the body functions can be arrested but preserved without harm for as long as 15 minutes, as compared with three minutes at normal body temperature. This gives time for cardiac surgery. This method is the only possible one for removing heartworms.

J. T. E.

Exudative Epidermitis of Pigs. JONES, L. D. (1956). *Am. J. vet. Sci.* **17.** 179-93.

The author describes a dermatitis of young piglets which resembles the eczematous condition described in Northern Ireland by Luke & Gordon (1950). The disease is widespread in the Mid-western states of the U.S.A. and appears to be increasing in incidence. It affects piglets of 5 to 35 days of age, with an average age incidence of 21 days. Usually the whole of a litter is affected. The mortality rate varies greatly, and is usually higher in the younger piglets, in which the disease runs a shorter course. In the 20 affected herds studied by the author 29 per cent. of the piglets were affected. These showed an average mortality rate of 68 per cent., representing 20 per cent. of the piglets at risk. No predisposing factors were found. There was, for example, no breed, sex or seasonal incidence. The disease occurred equally in piglets indoors and at pasture.

The first symptoms shown by the affected piglets are those of listlessness. The skin is dull and is covered by thin, dry, brittle scales, which appear light orange on a white-skinned pig or grey on a black skin. One or two days later the skin appears to be damp, oily and slightly thickened. Tiny brown spots are seen at the base of the hairs and at the openings of the sweat glands. The piglet may be apathetic or restless, and anorexia or thirst may be noticed. Later the anorexia and depression are more marked, and there is loss of bodyweight. Constipation is usual. Pyrexia and pruritis are not observed.

Beyond this stage the author recognises three main forms of the disease. In the *peracute* form there is marked erythema and the entire body is soon covered

with a moist sticky exudate, which may dry to form a loose scab over the raw, highly inflamed skin. The feet are invariably involved. The piglets become emaciated and dehydrated and usually die within three to five days. In the *acute* form the skin becomes greasy, thickened and wrinkled, while the brown spots mentioned above increase in number and size. Tiny vesicles and pustules develop, and rupture to form ulcers. The dried exudate forms scabs which fracture to form deep fissures. Anorexia and progressive emaciation lead to death in four to eight days from the onset. In the *chronic* form, which is the least common of the three, the thickening and wrinkling of the skin are more marked. Death may be delayed for three weeks, or there may be a slow recovery.

Post-mortem examination shows that the gross lesions are largely confined to the skin. The superficial lymph nodes are enlarged, and the renal pelvis, ureters or bladder invariably contain a deposit of urates. A secondary bacterial infection of the skin is invariably present. The histopathology of the condition is discussed at some length.

The author's investigation was confined to the clinical and pathological aspects of the disease. Its aetiology remains obscure.

E. A. G.

Reference

LUKE, D., & GORDON, W. A. M. (1950). *Vet. Rec.* **62.** 179-85.

Formalin-Treated Skim Milk for Pigs. BARBER, R. S., BRAUDE, R., & MITCHELL, K. G. (1956). *Agric., Lond.* **63.** 111-14.

The use of skim milk for the fattening of pigs would be greatly facilitated if a method could be found to prevent souring and clotting, so that the milk could be piped direct from storage tanks to the troughs. The authors found that the addition of 0.1 to 0.5 per cent. of formalin delayed clotting for several weeks. Some young pigs (9 to 11 weeks old) refused to take the treated milk and some others vomited after drinking it, but older pigs (18 to 20 weeks) took it readily. No tainting was found in the carcases. Further work is required to ascertain how frequently and thoroughly the storage tanks need to be cleaned.

E.A.G.

Farrowings in the Roundhouse. KENCHINGTON, F. E., (1956). *Agric. (Lond).* **63.** 27-8.

The author describes a circular farrowing pen or "roundhouse" similar to that devised in New Zealand by Smith (1954). It consists of a circle of hardboard, about 8 feet in diameter and 4 feet high, bolted to a light iron framework and fitted with an internal creep rail. A smaller circle, about 3 feet in diameter, made partly of hardboard and partly of tubular rails, is fitted eccentrically within the larger one, and the whole is fastened with bolts to the concrete floor of the piggery. The smaller circle which is warmed by an infra-red lamp, acts as a creep for the piglets, while the sow is kept in the space between the two circles. Because of the shape of this space, the sow invariably lies in the same position, with her udder towards the piglets' creep. This gives the piglets the maximum degree of safety. The author suggests that sows should come into the roundhouse 7 to 10 days before, and leave 7 to 10 days after, farrowing.

When nine sows were farrowed in the roundhouse it was found that the mortality among their piglets was less than in their previous litters which had been farrowed in conventional farrowing pens in the same house—and less than in the piglets of a control group of 13 sows, farrowed in the same unmodified pens. The difference was not statistically significant, but the author suggests that these preliminary results should encourage further work on this type of farrowing house. E. A. G.

Reference

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Cytopathic Changes in Tissue Cultures Derived from a Pig Infected with Hog Cholera. GUSTAFSON, D. P., & POMERAT, C. M. (1956). *Am. J. Vet. Sci.* **17.** 165-173.

Tissue cultures were prepared from various tissues of a pig that had been killed for examination six days after inoculation with a virulent strain of swine fever. Similar tissue cultures were prepared from an uninoculated litter mate.

The authors state that significant changes were observed in, for example, the epithelial cells of the spleen and lung tissues of the inoculated pig, and they suggest that further studies of this kind may be useful in the search for a laboratory method for the diagnosis of swine fever. E. A. G.

A Study of Clostridium Septicum. Sections 1 and 2. MCERLEAN, B. A. (1956). *Irish Vet. J.* **10.** 2-9 & 14-20.

The author carried out comparative tests with seven strains of *Cl. septicum* isolated from sheep and cattle.

All strains killed guinea-pigs in 17 to 22 hours after intramuscular injection. Liver impression smears from these animals showed filaments in six cases and single rods only in the seventh. Type specific *Cl. septicum* hyperimmune serum neutralised all the strains.

An examination of the cultural characteristics showed little variation between the strains; the author noted the highly pleomorphic appearance of the organism in cultures.

Glucose, lactose, maltose and salicin were fermented by six strains, with production of acid and gas, but sucrose, mannitol and glycerol were not attacked. The seventh strain failed to ferment glucose and maltose and had only a weak action on lactose and salicin. Cross-agglutination tests using sera produced in rabbits showed five of the strains to be related. One strain regularly auto-agglutinated and no suitable test antigen could be prepared. Of six strains tested all produced haemolysin. Sera prepared in rabbits against all the strains showed complete anti-haemolytic activity at titres varying from 1 in 100 to 1 in 6,400. Normal sheep serum showed a titre of only 1 in 50. M. B. H.

Laboratory Techniques for Isolation and Propagation of Vibrio from Cattle. BRYNER, J. H. & FRANK, A. H. (1955). *Am. J. Vet. Res.* **61.** 634-635.

The authors mention briefly some of the laboratory techniques which they use for the isolation and propagation of *Vibrio* from the genital organs of cows and bulls and from aborted foetuses and foetal membranes. The most suitable samples for the isolation of the organisms from living animals were mucus from the cervico-vaginal junction in cows and semen in bulls. At *post-mortem* examination the prepuce of bulls and the uterus or cervico-vaginal junction of cows were the most likely sources of the organism. In the foetus, *Vibrio* were isolated most frequently from the stomach contents.

For primary growth of *Vibrio*, 10 per cent. ox-blood agar plates incorporating 0.3 per cent. thiol, or Huddleson's thiol medium were used, and thiol or thiogylcolate medium for the maintenance of stock cultures. Cultures were incubated in 10 per cent. CO_2 at 37° C. for three to five days. Plates were examined under a stereoscopic microscope using a 13× magnification. Pathogenic *Vibrio* (*V. fetus*) appeared either as white circular colonies or as a spreading growth with a bluish hue at the periphery. The non-pathogenic *Vibrio* colonies were brownish green and spreading, with a metallic sheen and occasional partial haemolysis.

Microscopic examination was carried out under an oil-immersion lens with a phase-contrast microscope or in stained wet preparations with bright-field illumination.

M. B. H.

DIGEST

Antibiotics for Food Preservation

A new approach to the problem of preserving food is described in an Editorial of the *Journal Amer. Med. Assoc.* (1956.) Permission has been granted for the use of the antibiotic, chlortetracycline (aureomycin) in the processing of freshly killed poultry. The antibiotic is added to the ice slush of the chilling tanks, in which the birds are immersed for two hours immediately after killing and evisceration. The concentration of the chlortetracycline in these tanks approximates 10 p.p.m., which is sufficient to retard bacterial growth and thereby extend the store life of the carcase from 7 to 21 days. As a result of this treatment there is antibiotic concentration in the flesh of 2 p.p.m. The Food and Drug Administration of the United States have ruled that the flesh of treated birds shall not exceed 7 p.p.m. chlortetracycline. However, as the chlortetracycline is actually destroyed by cooking, it is unlikely that any active antibiotic would be ingested by the general public. The use of the antibiotic for the preservation of the flesh of other food animals is not yet permitted in the U.S.A.

Zinc and Skin Disease in Pigs

A skin disease of young pigs has been identified as the result of a zinc deficiency (Klussendorf, 1956). The skin of the legs, groin, and belly becomes thickened, irritating, and scabby, and badly affected pigs lose condition. This parakeratosis occurs with dry feeding, and is aggravated by an excess of calcium in the ration. It is rarely or never seen where wet feeding is practised. The addition of 100 p.p.m. of zinc to the food (100 mg. zinc per kg. of food) will cure the condition. However, care is required in providing a zinc supplement as 1,000 p.p.m. can cause a toxic reaction, manifested by diarrhoea and nervous symptoms.

Approximately 20 per cent. of the zinc content of the body is found in the skin and its appendages. Work with rats suggests that a zinc deficiency affects the cells of the epidermis resulting in oedema, an increase in the number of cell layers in the epidermis, with excessive keratinisation of the outer layers, loss of hair, and a decrease in pigmentation.

It is apparently quite evident that a high calcium intake by the pigs can increase the onset of a zinc deficiency, but how, it is not yet known; neither is the reason for the absence of the parakeratosis with wet feeding.

New Antibiotics

Five new antibiotics are in the process of evolution, two of which, Griseoviridin and Viridogrisein, have been used for the treatment of bovine mastitis. Schlingman *et al.*, 1956, describe the response obtained by these two antibiotics on a number of cases of acute and chronic mastitis, in which the causal organisms included staphylococci, coliform bacteria, and Pseudomonas sp. A dose of 250 to 500 mg. of one, or other, of the antibiotics was instilled into the affected quarters by the teat canal. Milk samples were cultured before and after treatment from which a marked reduction in the numbers of bacteria was noted in all cases. Lactation returned to normal and the administration of the antibiotics was without ill effects to the animal.

Three new antibiotics are mentioned in a review in the *B.M.J.* (1956), all of which appear to possess good anti-staphylococcal action. The most promising of the three is Novobiocin (syn. Albamycin, Cathomycin or Cardelmycin) which, after oral administration, attains a higher blood concentration, dose for dose, than any other antibiotic. This action is the result of its excretion in the bile and subsequent reabsorption from the intestinal tract, and the fact that it is not readily eliminated in the urine. Novobiocin has been used successfully in human medicine at a dosage rate of 0.5 gramme four times daily, although side effects, mainly of the skin, were noted in 5 to 10 per cent. of patients. The other two antibiotics to which reference is made are Vanomycin and E.129. Both these compounds still await clinical appreciation.

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News and Comment

THE DIPLOMA IN TROPICAL VETERINARY MEDICINE

At a Graduation Ceremony held in the McEwan Hall of the University of Edinburgh, on July 18th, the following were awarded the Diploma in Tropical Veterinary Medicine:—

Campbell, Robin Johnston, B.SC., M.R.C.V.S.; Condy, John Beatty, M.R.C.V.S.; Ferguson, William, M.R.C.V.S.; Hague, Douglas Charles, M.R.C.V.S.; Hammond, John Arthur, M.R.C.V.S.; Hardie, Henry, M.R.C.V.S.; Hazarika, Rabindra Nath, G.V.SC. (Bengal Vet. Coll., Calcutta); Louisy, Greaham Eric, D.V.M. (Toronto); Mackie, Alexander Muir, M.R.C.V.S.; Pfob, Lewis Stanley, M.R.C.V.S.; Rashid, Ahmed, M.R.C.V.S.; Rennie, James Douglas, B.SC., M.R.C.V.S.; Renwick, Charles Campbell, M.R.C.V.S., and Tremlett, John Gerald, M.R.C.V.S.

This is the first award of the Diploma since teaching for it was recommenced by the University after it had lapsed at the commencement of the war.

THE COLONIAL VETERINARY SERVICE

The following appointments have recently been made. Mr. A. E. Dorman (provincial veterinary officer, Kenya) to become assistant director of veterinary services, Kenya; Mr. K. J. R. Maclennan (senior veterinary officer, N. Region, Nigeria) to become principal veterinary officer; Mr. W. Plowright (veterinary research officer, Federation of Nigeria) to become veterinary research officer (pathologist) E. African Veterinary Research Organisation, E. Africa High Commission. Mr. G. D. Phillips, to become veterinary research officer, E. African High Commission.

IN PARLIAMENT

ATOMIC ENERGY

Strontium 90 (Effects)

MR. WATKINS (July 25th) asked the Lord Privy Seal what effects strontium has had upon Welsh mountain sheep; and if he will make a statement.

THE SECRETARY OF STATE FOR THE HOME DEPARTMENT AND MINISTER FOR WELSH AFFAIRS (MAJOR GWILYM LLOYD-GEORGE): I have been asked to reply.

In studying the distribution of radioactivity arising from fall-out, measurements have been made of the strontium 90 associated with the calcium in various biological materials. Among the representative samples of sheep bones examined, a few from very localised mountain areas in Wales have shown higher values than those from other areas. Even so, the levels are too low to have any detectable effects on sheep.

Progeny Testing Stations (Pigs)

MR. PHILIPS PRICE (July 26th) asked the Minister of Agriculture, Fisheries and Food what progress has now been made in the setting up of progeny testing stations for pigs in the country.

MR. AMORY: Good progress is being made with building the first station at Selby (Yorkshire), which I hope will be ready to start testing early next year. Tenders for the other three stations in England and Wales have been accepted.

MR. PRICE: Are the finances for these stations being found by a levy or direct from the Treasury?

MR. AMORY: The capital cost of these stations is to be met by the Government, in the first instance, and recovered from the industry over the years through the mechanism of the Annual Price Review.

Turkeys

MR. DONNELLY (July 26) asked the Minister of Agriculture, Fisheries and Food what his policy is towards the importation of turkeys in the forthcoming autumn and winter.

MR. AMORY: Our policy remains to allow importation freely, apart from restrictions imposed for balance of payments reasons or considerations of animal health.

Myxomatosis

SIR W. ANSTRUTHER-GRAY (July 26th) asked the Minister of Agriculture, Fisheries and Food to what extent he estimates that the dearth of rabbits owing to myxomatosis has affected the population of other beasts and birds and, in particular, foxes, rats, weasels and buzzards.

MR. AMORY: I have insufficient evidence at present on which to arrive at any reliable estimate. There is evidence that foxes and other predators of rabbits have turned to rats and other small ground vermin. Buzzards suffered a substantial reduction in the breeding rate last year, but they are now said to be recovering in some areas.

SIR ANSTRUTHER-GRAY: Will my right hon. Friend make every effort to keep himself abreast of all existing developments in order that we may be able to appreciate whether the lack of rabbits is a blessing or a curse?

MR. AMORY: Yes, I most certainly will take my hon. and gallant Friend's advice on that point. I think the present evidence is enough to show that, in general, these changes are a blessing. Quite apart from rabbits, the reduction in rats, whatever the cause for it, is really most encouraging, and will redound very much to the advantage of home food production.

UNIVERSITY NEWS

London

Veterinary Pre-Clinical Examination, Part II

Alexander, Patricia Joan; Castell, Michael John Hartley; Clemenger, John Frederick Parsons; Davies, Edryd Morgan; Hitchcock, Percy Lewis; Jackson, Peter Stewart; Kirby, Brian; Porter, George; Smith, Roderick John; Thurley, David Crispin; Trim, Peter Noel; van Laun, Thomas; Wade, David William Howard; Winstanley, Eric William; Wrigley, Arthur.

B. Vet. Med., Part I Veterinary Clinical Examination
Blackburn, John Trevor; Cheyne, Ian Alexander; Gale, Vincent George; Holt, Eric Arthur; Jenkerson, Paul Richard; Little, Neil Roy Forster; Townley, Michael Herbert Ajderian; Wildgoose, John Douglas.

THE TOM NEWMAN AWARD

It is announced that the 1956 Award shall be made to Dr. B. R. Burmester, B.S., A.M., D.V.M., Regional Poultry Research Laboratory, Agricultural Research Service, U.S. Department of Agriculture, East Lansing, Michigan, U.S.A. The Award, instituted in 1948 by the Poultry Association of Great Britain, has been won on five occasions by United States research workers and three times by United Kingdom workers.

THE HAMPSHIRE CATTLE BREEDERS' SOCIETY

In the course of his speech at the Society's Annual General Meeting, Mr. G. N. Gould, the Chairman, said:—

" Mr. Madden, our veterinary officer, has rendered notable service to the Society on the technical side, and the development of the field application of deep freeze semen has in his hands led the A.I. movement in this country. It has been used in over 60,000 inseminations with a conception rate averaging about 60 per cent. I am happy to acknowledge the continued co-operation of Mr. L. E. A. Rowson, O.B.E., M.R.C.V.S., of Cambridge, both in this technique and also in the application of artificial insemination of pigs, together with that of his colleague Mr. C. Polge.

" It would appear that the future development of the processing of semen for high fertility will demand laboratory facilities and equipment of a standard difficult to meet in our present buildings. The progress of our building plans is therefore well timed not only on these grounds but on the grounds of the continued expansion of the Society's affairs and the demand from the farmers of the area. The building of the new centre is a milestone in the Society's history and a very necessary, if expensive, investment for the future. Our plans are such that we believe the full requirements of the Society will be met. Building will start this year.

" There has been a continued increase in demand for A.I. from the Society's bulls in 1956—amounting to 20 per cent. for the first five months, indicating that the total inseminations to be carried out this year will be in the region of 57,000. This follows an increase of 6,887 in 1955, 6,570 in 1954, and 7,529 in 1953. The Committee accept this increased demand as an indication of the confidence of the farming community.

" Recently there have been published reports of statements made by critics of the A.I. movement who seem to be particularly ill informed. I welcome the statement made by Mr. Geoffrey Smith, Chief Veterinary Officer of the Milk Marketing Board, and Dr. Joseph Edwards, whose work in this sphere is so outstanding, answering recent statements reporting the possible spread of disease by A.I. bulls. As they so rightly point out those responsible for A.I.—together with the Animal Health Division of the Ministry of Agriculture—have taken and continue to take every practical precaution known to science to maintain the highest veterinary standards in the A.I. service. I concur with the opinion expressed that there is no evidence to support the scare headlines of a vast increase in infectious infertility generally or its association with A.I. Statistics of A.I. breeding and of pedigree breeding as disclosed in National Milk Records refute such statements.

" That individual herd problems exist there can be no doubt—that venereally transmitted diseases had and do exist—there was also no doubt—but to suggest there was a vast increase in such diseases was not in accordance with statistical evidence available, or my own experience.

" The introduction of A.I. for pigs is gradually showing promise. A conception rate of 50 per cent. has been achieved recently and gives hope of possible commercial introductions in the future."

FIFTY YEARS AGO

In THE VETERINARY RECORD of August 4th, 1906, a leading article comments upon the recent N.V.M.A. Congress at Liverpool. Having referred to several of the papers read, the article continues:—

" The local press recognises our efforts by a notice of our proceedings, and it generally favours us with a judicial summary of the work done at the meeting and a general estimate of our professional value. The *Liverpool Post* and the *Courier* each devoted a leading article to us. Both are friendly and appreciative, but perhaps not so flattering as we might wish. The lesson we gather from the Liverpool press is that we have neglected to display our importance, and that in future we should keep ourselves more distinctly before the public whilst avoiding any sign of swelled head."

The Liverpool *Courier* certainly was " friendly and appreciative," but the *Post*, on the other hand, did its best to ensure that the profession would " avoid any sign of swelled head." Among a number of other observations the *Courier* wrote:—

" There is no longer any dubiety in regard to the importance—the developing importance—of the scientific investigation and practical work performed by veterinary surgeons, and it seems about time that they received more general recognition from local public bodies, who are too prone to give veterinary work to medical officers.

" Professor Boyce's excellent paper on ' Public Health and Veterinary Science,' read to the members of the Conference at our University yesterday, and the discussion which followed, serve to demonstrate that veterinary surgeons have a very important place in regard to public health in these days of haste and bustle.

" The Liverpool School of Veterinary Medicine provides the equipment for all prepared to take advantage of its offer, and no doubt in a short time the veterinary surgeons will make their influence felt much more widely. Professor Boyce's paper must stimulate them to renewed zeal in cultivating their branch of science and in taking care that they have their due share of public offices. In fact, yesterday, it was disclosed, that ' vets ' recognise ' the great

hardship that medical men should rob veterinary surgeons of their practice, and hold positions which should only be held by qualified veterinarians.' "

The *Post* in contradistinction to the above scolded the profession severely:—

" Veterinary surgeons have not yet impressed themselves upon the public as men of research or of special capacity in dealing with the diseases that affect animals, and that, by affecting animals, have a direct influence upon the health of man. The way to capture posts, Professor Boyce tells them, is to be equipped, and he deplores the fact that, at any rate in this country, little opportunity has been offered for the study of preventive and curative sera and vaccines amongst the veterinary profession. But demand creates supply. If there had been a desire amongst veterinary students for the opportunities, the absence of which is deplored, it is tolerably certain that they would have been supplied. Medical men have found them and profited by them. Professor Boyce remarks that to a very large degree this aspect of medical science has been monopolised by medical men even when the vaccines were destined for animals. If veterinary surgeons leave investigations, and research, and experiment to medical men they must not be surprised, and have no right to complain, if medical men appropriate the results. By all means let them aspire to inspectorships of live animals, of animal products, and of meat whether tinned or otherwise, but they must first convince the public of their qualifications."

It may be observed that although, in these days, the veterinary qualification is on a par with that of any comparable profession, we are still lacking in a number of directions, even 50 years afterwards, that " due share of public office " we have the right to expect.

HOSPITALITY WANTED

A 26-year-old Italian girl living in Pregansiol, would like to stay *au pair* for six months in England beginning about the middle of August, if possible, until about the middle of February. She would be willing to look after children, give light help in the home, and also to teach Italian and French. She would also, however, like to spend some time in an English school studying the language. She speaks some English already. Members who may be willing to extend the hospitality asked for are requested to write to the General Secretary of the B.V.A.

CALVES (FEEDING IN TRANSIT) ORDER

The Minister of Agriculture, and the Secretary of State for Scotland, have made an Order under this title prohibiting the feeding of milk to calves in transit, except milk which has been reconstituted from dried milk. The purpose of this regulation is to safeguard against the risk of spreading foot-and-mouth disease arising from feeding calves with raw milk which might have been infected. Attention was drawn to this risk by the Gowers Committee on Foot-and-Mouth Disease. Copies of the Order may be obtained from H.M. Stationery Office, price 3d. net.

PERSONAL

Births

FRASER.—On July 14th, 1956, to Eleanor, wife of Donald Fraser, B.SC., M.R.C.V.S., 27, Nelson Street, Huntly, Aberdeenshire, a son.

SINCLAIR.—On July 28th, 1956, to Gladys, wife of Edward Norman Sinclair, M.R.C.V.S., of 85, Earl's Court Road, London, W.8, a son, Richard Ian.

R.C.V.S. OBITUARY

We record with regret the death of the following member of the profession:—

HALL, Reginald William, 31, Porth-y-Castell, Barry, Glamorgan. Graduated July 14th, 1897, London. Died suddenly on July 28th, 1056, in his 83rd year.

MR. JOHN D. FERGUSON

Mr. Harry M. Wilson writes:—

The interment of John D. Ferguson took place at Callander, Perthshire, on Wednesday, July 25th, 1956. " Jack " had practised at Crieff for 31 years and ill health compelled his recent retirement after which he lived at Rumbling Bridge. His popularity was demonstrated by presentations on his retirement and by the large numbers at the funeral service. Among members of the veterinary profession present were: Mr. K. P. Anderson, Mr. G. S. H. Ashworth, Mr. G. S. Beattie, Professor G. F. Boddie, Mr. R. Cullen, Mr. W. W. Gregor, Mr. E. F. Hardwick, Mr. F. J. V. Mayne, Mr. E. A. McPherson, Mr. R. R. Macrae, Mr. R. F. Ross, Mr. G. T. Weir, and myself.

Our sympathy is extended to Jack's wife who survives him.

Mr. F. J. V. Mayne writes:—

Members of the profession will have learned with regret of the death of J. D. Ferguson, late of Crieff, Perthshire. Commencing practice in Crieff in the 1920's, he steadily built up a large and flourishing connection with agriculturists over a wide area in central Perthshire. A man who devoted himself almost entirely to his profession, he was respected and liked by all who knew him. There are many in Perthshire who recall not only his diagnostic skill—for that was never in doubt—but his unfailing sympathy and practical kindness especially to the smaller type of stock-owner. He gave of himself unstintedly, and too often, one thought, without considering his own physical well-being; but the good name of the profession and his own integrity were always motive forces with him.

He retired in 1955, and though in indifferent health for some time, his passing was sudden and unexpected.

Professor Boddie writes:—

It was with very genuine grief that the many friends of Mr. J. D. Ferguson learned of his death on Sunday, July 22nd, at his home near Rumbling Bridge in Perthshire.

After a period of military service in the first World War Mr. Ferguson qualified at the Glasgow Veterinary

College in July, 1921. Like many who qualified from that school after the first World War his heart was set on general practice. After gaining general experience he set up in practice in Crieff, Perthshire, in the middle 1920's. His practice grew steadily until it extended beyond the broad bounds of Strathearn into the neighbouring glens of Glendevon, Gleneagles, Glenartney, Glenlednock, and Glenalmond. Not infrequently he was called to even more remote places such as Glendochart and Glenlochay.

In Strathearn are to be found some of the finest herds of pedigree beef cattle in the whole world—it is from these herds that very valuable pedigree stock are exported over the world—and Mr. Ferguson's services were in constant demand. Throughout his professional life of 35 years, Mr. Ferguson never spared himself, and the needs of his patients and their owners were at all times his first consideration, and no personal inconvenience that he might experience was ever too great. In his practice there were many small farmers and small-holders; during the period of agricultural depression between the two wars things were difficult for these people and it is common knowledge that they always received the utmost consideration from Mr. Ferguson and that he treated them with great generosity. Often it seemed that his reward was the satisfaction of a job well done and with that he was well content.

Mr. Ferguson married Miss Christian Cairns, the youngest daughter of the late Mr. Wm. Cairns of Dalchruin, Comrie, and Concraig, Crieff, a well-known Strathearn sheep-farmer; there was no family.

Jack Ferguson, to give him the name by which his friends all knew him, was one of the kindliest of men and by his steadfast service and genuine interest in the well-being of his fellows has left an enduring memory of a life well spent. In the last few years Jack Ferguson was much troubled by ill-health intensified and possibly brought on by his refusal to spare himself in the service of his clients. A few months ago he retired from active practice and went to live near Rumbling Bridge. As recorded in THE VETERINARY RECORD he was the recipient of a most striking tribute by the farming community in Strathearn. The period of rest that followed his retirement has proved to be all too short.

Throughout his life Jack Ferguson remained a student of his profession and was a stimulating, though demanding, guide to many an undergraduate. He would spare no effort in training the interested student in every aspect of general practice. Those fortunate enough to have had this experience remember him as a friend to whom they are still deeply indebted.

His relations with members of the veterinary profession were always on the happiest level and he merited the highest compliment that can be paid to a professional man by his professional brethren that he was a good neighbour.

To his widow there goes out from his many friends the fervent prayer that she may be sustained by their sympathy and affection.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Glamorgan. Little Parc, Thornhill, Cardiff (July 30).

Kent. Hurst Farm, Shadoxhurst, Ashford (July 23).

Lancs. Hill Top Farm, Grindleton, Clitheroe (July 21).

Monmouth. The Ton Farm, Raglan (July 26).

Montgomery. Ivy House, Leighton, Welshpool (July 24).

Shrops. Grove Farm, Condover, Shrewsbury (July 20); Hollybank Farm, Cruckton, Shrewsbury; Heath House Farm, Romsley, Bridgnorth (July 23).

Somerset. Batch Farm, Lympsham, Weston-super-Mare (July 21); Lower Hutchings, Keinton Mandeville (July 30).

Staffs. Barlaston Road, Cocknage, Longton, Stoke-on-Trent; Yew Tree Farm, Yarnfield, Stone (July 23); Lightwood Lodge Farm, Lightwood, Longton, Stoke-on-Trent (July 28)

Surrey. Hullers Farm, Bears Green, Dorking (July 28).

Warwicks. Home Farm, Hurley, Atherstone (July 26).

Fowl Pest

Essex. Clanmere, North Drive, Hutton, Brentwood (July 26).

Lancs. Pack Saddle Farm, Buxton, Chorley (July 20); Brook House Farm, Charnock Richard, Chorley; Hole House Farm, Charnock Richard, Chorley (July 21); South Cottage Farm, Princess Street, Chorley (July 24); Cardwell Arms, Adlington, Chorley; 63, Bolton Road, Chorley (July 25); 63, Anderton Street, Chorley; Princess Street Allotments, Chorley; Allotments of Rawlinson Lane (July 26); Carrick House, Jolly Tar Lane, Copall, Chorley; Yarrow Mill Factory, Chorley; 37 and 60, Canterbury Street, Chorley (July 27).

Lincs. 34, Bank Lane, Heckington, Sleaford (July 22). Chestnut Farm, Hawthorn Hill, Dogdyke (July 24); Main Road, Leverton, Boston (July 26); East Villa, High Street, Cherry Willingham (July 27).

Swine Fever

Devon. Ashridge Farm, Modbury, Ivybridge (July 30).

Essex. Houses Farm, Great Sampford, Saffron Walden (July 24); Street Farm, Ashen, Sudbury (July 31).

Lancs. Primrose Hill, Bull Park Lane, Hambleton, Blackpool (July 25).

Lincs. Chestnut Terrace, Sutton Bridge, Spalding (July 27).

Middlesex. Burrow Hill Close, Stanwell New Road, Stanwell Moor, Staines (July 30).

Midlothian. 12 Holding, Wester Hailes, Slateford, Edinburgh (July 27).

Norfolk. Highview Farm, Swanton Morley, Dereham (July 31).

Roxburgh. Croftside, Roxburgh, Kelso (July 27).

Shrops. New Park Farm, Ditherington, Shrewsbury, Coalport, Ironbridge (July 24); Admaston Farm, Wellington (July 27).

Somerset Withial Farm, East Pennard, Shepton Mallet (July 24); Castle Farm, Dundry, Bristol (July 25); Batch Farm, Lamyatt, Shepton Mallet; Knowle Hill Farm, Chew Magna, Bristol (July 26); Wickham Farm, Marston Magna, Yeovil (July 30); Holway Farm, Holway, Corton Denham, Sherbourne; Little Pennard Farm, East Pennard, Shepton Mallet (July 31).

Staffs. Levedale House Farm, Levedale, Penkridge (July 27); Overdale Poultry Farm, Colwich (July 30).

Surrey. 132, Pepperharrow Road, Godalming (July 24).

Yorks. Philadelphia Cottage, Ryton, Malton (July 27).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

Foot-and-Mouth Reports Wanted

Sir,—For some time we have been attempting to obtain copies of all the Progress Reports of the British Foot-and-Mouth Disease Research Committee of the Ministry of Agriculture and Fisheries. We find that these publications are all out of print and are extremely difficult to obtain. Will anyone who is willing to dispose of copies of the Reports kindly get in touch with us? There are five reports in all and they were published in 1925, 1927, 1928, 1931, and 1937 by H.M. Stationery Office. They are needed for our library.

The Pan American Foot-and-Mouth Disease Center is an international project sponsored by the Pan American Sanitary Bureau (regional office of WHO) and the Organisation of American States to assist countries in this hemisphere in prevention and control of foot-and-mouth disease.

Yours faithfully,

PETER R. ELLIS.

Pan American Foot-and-Mouth Disease Center,
Caixa Postal 589,
Rio de Janeiro,
Brazil.

July 17th, 1956.

Retention of Meconium in Thoroughbred Foals

Sir,—An article by Mr. J. S. M. Cosgrove (*Vet. Rec.* **67**, 961) refers briefly to the retention of meconium in Thoroughbred foals. I find this condition most serious in South Africa. In most cases the treatment recommended by Mr. Cosgrove and Mr. Collins produces normality. However, in this country, especially during dry seasons such as we experience, this treatment may be quite useless. Naturally, attempts are made to bring about relief of the condition by the methods described by the author before instituting surgical procedure. However, veterinarians soon learn by experience those cases that are unlikely to respond to ordinary methods of treatment. The size of the pelvic opening and the consistency of the meconium are the main factors upon which treatment is based.

Having had a long experience with the diseases of the new-born foal in this country, I now decide early whether it is advisable to do a laparotomy and remove the obstruction by breaking down the balls of meconium by pressure through the bowel wall, and pushing them, one by one, into the rectum through the pelvic inlet, from where they are removed by the finger of an assistant.

I have described the operation and the method of anaesthesia which I have used. At present I use intravenous pentobarbitone sodium* as an anaesthetic. The laparotomy is performed in the left flank.

Following the operation I do not restrict the foals' movements in any way. There is little or no discomfort; in fact they are quite happy and play around next day as healthy foals do.

In my opinion laparotomy is the treatment of choice when relief cannot be obtained within 8 to 10 hours by ordinary methods, or when the pelvic opening is too small to allow the passage of rubber-like balls of meconium, or when balls of meconium, removed with a suitable spoon, are rubber-like in consistency.

Mr. Cosgrove states that two foals, which died as a result of retention of meconium, were examined *post mortem*. I feel it would be unwise to delay laparotomy so long as to endanger the life of a foal; it should be done early, but Mr. Cosgrove does not mention surgical procedure in his paper.

Yours faithfully,

JOHN QUINLAN.

1, Heather Road,
P.O. Westville,
Natal,
South Africa.

June 10th, 1956

* Sagatal, May & Baker.

Anaesthesia in the Pig

Sir,—It is quite apparent that surgery in the pig is, largely on economic grounds, an established fraction of general practice to-day. Messrs. R. H. C. Penny and J. H. S. Arnold in their letter (July 7th, 1956) and several others in the recent past have drawn attention to the varied anaesthetic techniques employed, which, in my opinion, are possessed of mechanical and other disadvantages. The volatile anaesthetics are unsatisfactory in that it is difficult to ensure controlled anaesthesia, and the toxic hazards of chloroform, for example, are well known. The use of barbiturates or chloral hydrate intraperitoneally must be considered somewhat unsatisfactory because of the possibility of traumatic injury in a restive animal and the variable absorption rates in different sites and different animals.

Intravenous anaesthesia, again, is not entirely satisfactory owing to the difficulty of entering the vein in the young piglet, restraint in the mature animal, haematoma formation and the ever-present risk of over-rapid induction precipitated by a struggling animal.

Almost all surgery in the pig is post-umbilical and I have found in approximately 50 cases, that the operational sites are most satisfactorily encompassed by epidural anaesthesia. The technique is very simple and is exactly as described by Professor J. G. Wright (1952). I have not, as yet, encountered the misfortune of an apparently permanent paraplegia in a case as quoted by the Professor, and on reflection, it is difficult to incriminate epidural anaesthesia *per se*, as the culprit. The spinal cord proper ends before the lumbo-sacral space which renders direct trauma unlikely.

I have only used Xylotox and I confess that dosage is largely rule of thumb determined by the size of the pig and the site of the operation. However, as a guide, I suggest that in operations for amputation of

the prolapsed rectum, scrotal hernia, imperforate anus, etc., ½ c.c. per 10 lb. bodyweight up to 70 lb. should be the upper limit. For umbilical hernia or laparotomy operations, etc. the above rate plus 1 c.c. should obtain. In animals over 70 lb. I cannot offer such hard and fast rules, but I have found, for example, that 10 c.c. in a mature Landrace boar for amputation of the digit was perfectly satisfactory, and 5 c.c. is quite adequate for the castration of five- and six-score boars. The resulting paraplegia is of two to three hours' duration, and I recommend that the pig should be closely confined during the recovery stage.

Small pigs are easily restrained on a table for the injection, but mature animals must be roped behind the tusks or confined in a crush. It is interesting that once anaesthesia has been effected the pig becomes very quiet and may hardly move during the operation. Humans, similarly anaesthetised, describe firstly a feeling of faintness, followed by a drowsy sensation, which I presume to be due to the fall in blood pressure consequent upon this form of anaesthesia.

Yours faithfully,
C. N. S. LAKIN.

Highcroft,
London Road,
Hailsham,
Sussex.

July 9th, 1956.

Reference

WRIGHT, J. G. (1952). "Veterinary Anaesthesia," 3rd edn. p.78. Baillière, Tindall & Cox, London.

Scottie Cramp

Sir,—May I thank Messrs. Bateman and Lambert for their interesting letters on cramp.

Replying to Mr. Bateman, I recall very clearly his note on the subject of cramp in the racing Greyhound but I adhere to my opinion that this and Scottie cramp, although symptomatically identical, are fundamentally different. To elaborate this theme, the racing Greyhound is physically fit in the athletic sense and is subject to an attack of cramp during induced maximal exertion; the average pet Scottie (with one minor exception all my cases were in ordinary household pets) is only fit in the ordinary sense, and not always that, and its cramp occurs during exercise at ordinary (and to a Scottie this is usually not fast) paces voluntarily controlled. One would not regard an athlete having an attack of cramp during a race as having a disease, but a person suffering from intermittent claudication which prevents even a low average exercise tolerance surely has, and it is to the latter I liken Scottie cramp.

In all my cases dogs have been kept under ordinary house conditions and no opportunity for an anxiety state to develop occurs; furthermore sedation, in my hands, has had no effect on any case treated although it has always been tried. Sex incidence in my cases has been fairly evenly divided; only one male has to my knowledge been used at stud and as the owner has now left this district I have lost contact with the case.

Obviously Mr. Lambert sees far more of this condition than do most of us, although I have a shrewd suspicion that in England numerous cases occur in breeders' kennels which never reach a clinician's hands; Scottie breeders are, with some justification, a little sensitive on the subject of breed abnormalities!

I did not mention lactation as an exciting cause for the simple reason that none of my cases has occurred in a breeding bitch. Since calcium and parathyroid both alleviate the symptoms it is logical that any condition lowering blood calcium would aggravate or excite symptoms. I have not used parathyroid or calcium in treatment since I had regarded both as rather short-term measures (this is obviously not so according to Mr. Lambert's experience) and was looking for a line of attack which would give me less spectacular but more permanent results; this I am hoping Vitamin E has done. I should also be dubious of using long courses of parathyroid, an agent I view with some uneasiness.

Yours faithfully,
JOAN O. JOSHUA.

78, Brentway,
Finchley, N.3.

July 30th, 1956.

Traumatic Reticulitis in a Ewe

Sir,—It is of interest to note that a *post mortem* which I performed on a ewe on April 11th, 1956, disclosed the cause of death to be a traumatic reticulitis, due to a small piece of wire which had penetrated the medial aspect of the reticulum, with a resulting diffuse peritonitis of the entire anterior portion of the abdominal cavity. There were considerable adhesions between the reticulum, liver, and the adjacent portions of small intestine. The entire picture was identical with that occurring in cattle. This ewe had not been noticed to be ailing prior to death. I have not seen or heard of this condition occurring in the sheep before.

Yours faithfully,
OLAF SWARBRICK.

Surrey House,
Arundel,
Sussex.

July 21st, 1956.

We regret that, owing to lack of space, the Summary of Returns under the Diseases of Animals Act (1950) has to be held over. It will be published next week.